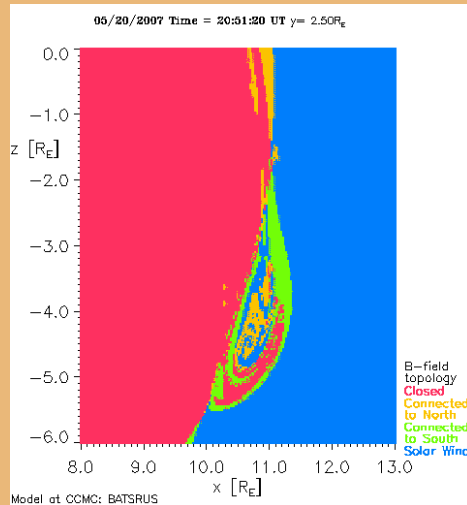
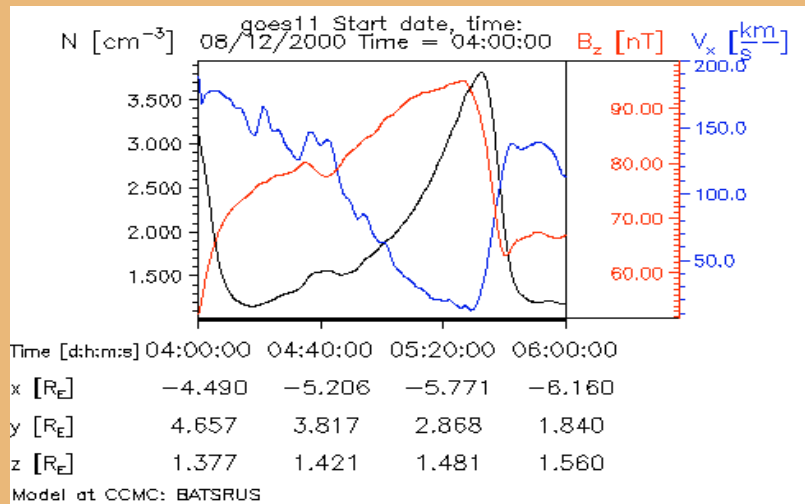


# Progress: Run-on-Request Visualization



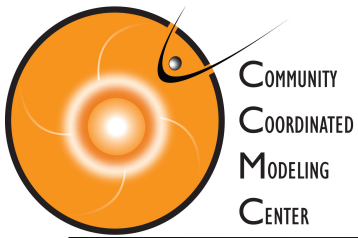
## Magnetic topology

- Field lines started on adaptive grid in cut plane
- Available as single plot or in Movie-on-Request

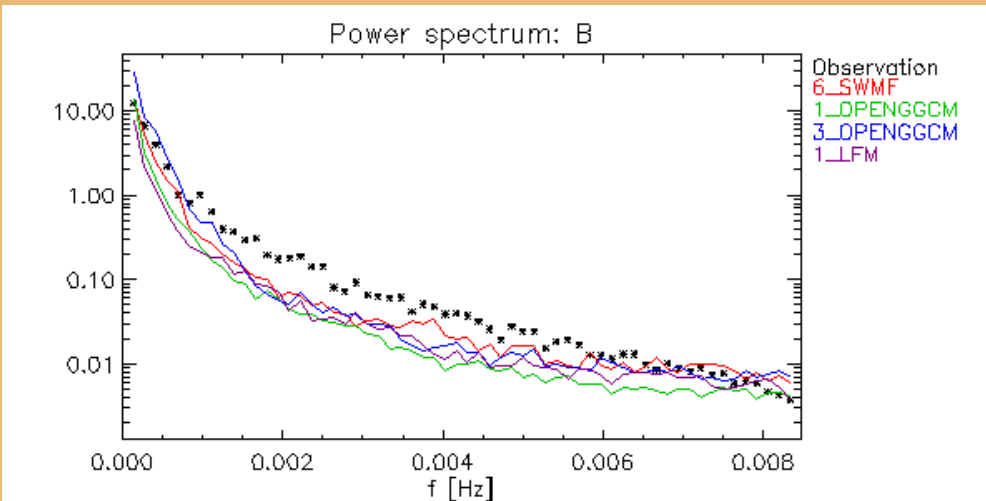
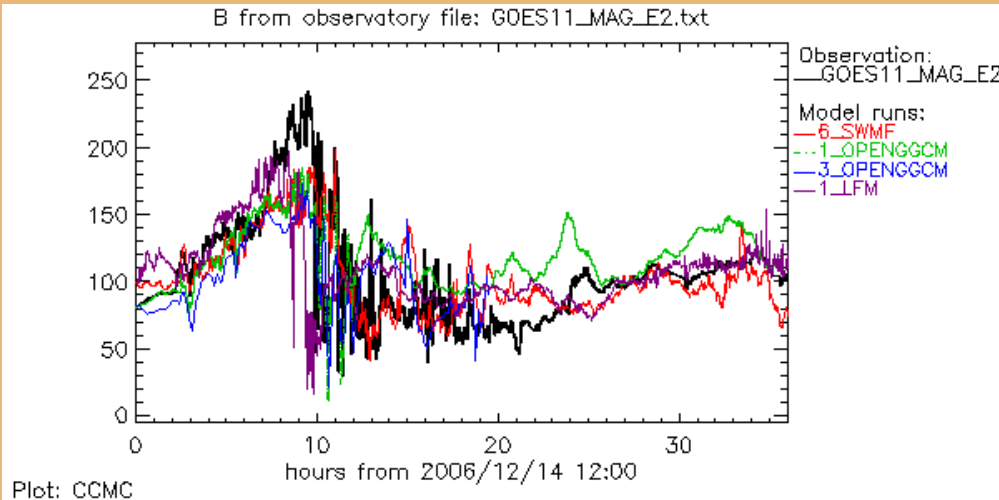


## Time-series generation:

- Track satellites through 3D magnetosphere
- Follow single position (or line in space) in time
- Over-sampling possible in time

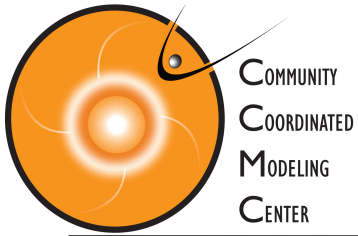


# Progress: Metrics Study Visualization

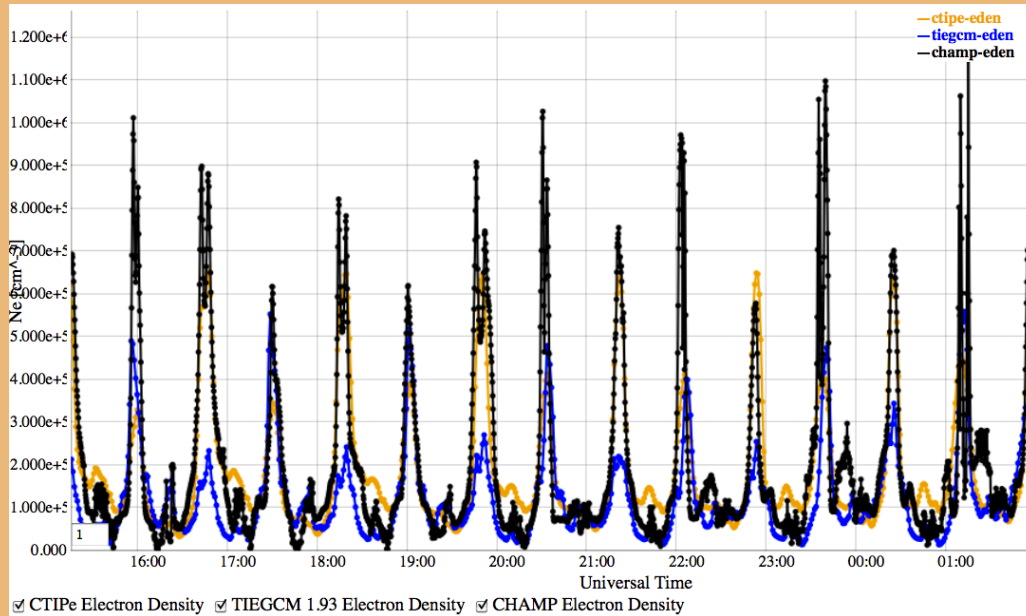


## Metrics study timeline tool

- Select color and line style for each model trace
- Computation of skill scores
- Set parameters for Fourier Transform
- Display power spectrum

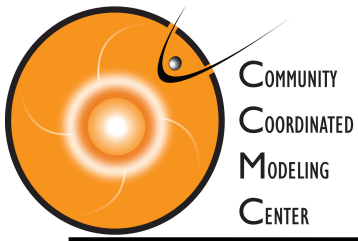


# Progress: Timeline Tool for Climatology



## Timeline tool for long data sets

- Select traces for models
- Pan right and left
- Select custom time interval
- Apply rolling average

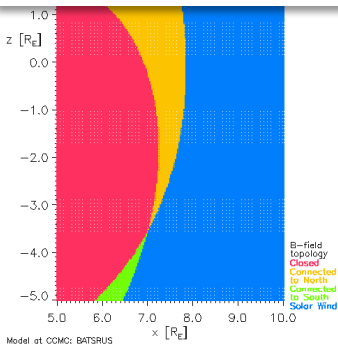


# Progress: visualization

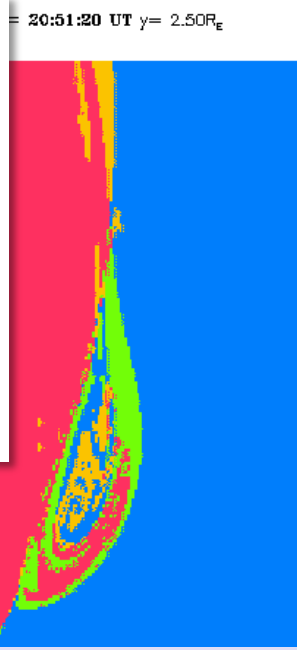
- Magnetic topology for all magnetosphere models
- Field lines started on adaptive grid in cut plane.
- Available as single plot or in Movie-on-Request

## Example:

Bruce\_Tepke\_111011\_3b  
 Make **global plot** first (at  $Y=0$ ):  
 Select Plot Mode "Contour"  
 Deselect "Display Contour Data"  
 Grid:  $N1=7$ ,  $n2=7$  and  $adapt=5$   
 Then **local plot** in dayside:  
 $X_1=5$ ,  $X_2=10$  and  $Z_1=-5$ ,  $Z_2=2$



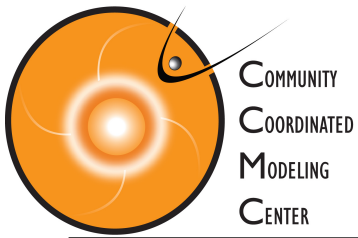
Set spacing of base grid and number of adaptation levels



## Plot Options:

- Exclude region around the Earth up to   $r_E$
- Image magnification
- (all images; use  $\geq 1.25$  for 3D Flowlines)
- Line thickness  (flow lines, arrows)
- Character thickness  (all annotations)
- Allow variable plot image size (all 2D plots: aspect ratio  $dx/dy$  between 0.3 and 4)
- Show simulation grid (disabled with 3D-Surface)
- Show magnetopause (positions in 2D cuts passing within 12  $R_E$  of Earth will be listed at the bottom)
- Tolerance (between 0.01 and 1  $R_E$ ):
- Show magnetic topology (use with "Contour", "Vector" or "Contour+Vector" plot modes: Add color coding by magnetic connectivity: red: closed, blue, open, yellow: connected to north, green: connected to south)
- Display Contour data with topology plot
- Elements in base grid from which field lines emanate:
  - Base grid size
    - Horizontal  $N1$ : (between 5 and 11):
    - Vertical  $N2$ : (between 5 and 11):
  - Refine base grid by  $2^{Adaptation}$ , computation time or this will scale accordingly:
    - Adaptation: (between 2 and 6):

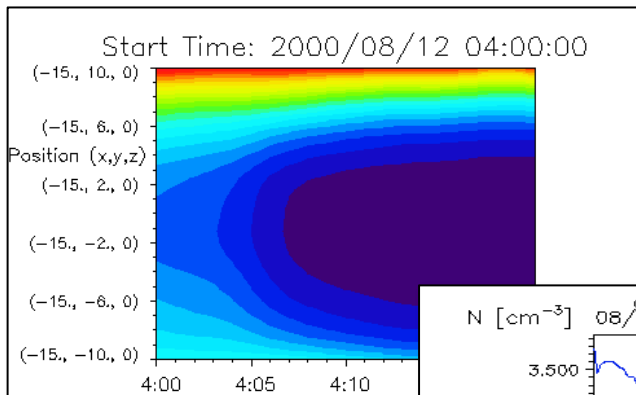
Movie file: file:///Users/Lutz/downloads/David\_Sibeck\_112707\_1\_movie\_32233.gif



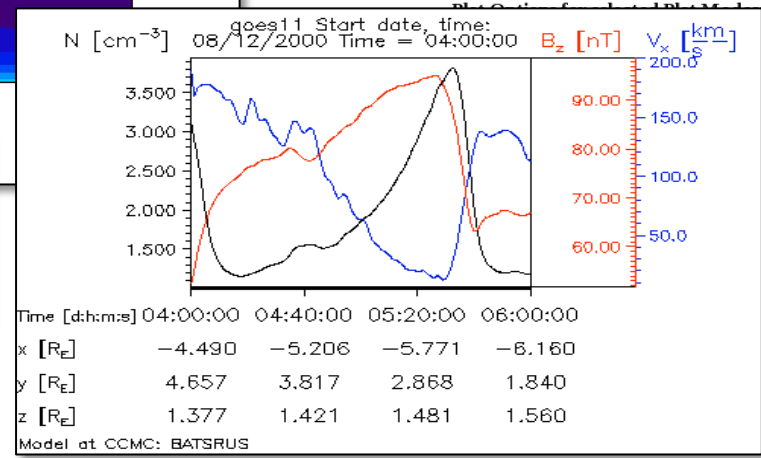
# DEMO: visualization of time series

## 2) Track satellites or line through 3D magnetosphere

Example:  
Bruce\_Tepke\_111011\_3b



Follow line  
(-10,-10,0) to  
(-10,10,0) in time



3D Simulation Results: Model: BATSRUS  
Run: Bruce\_Tepke\_111011\_3b

This is the web interface to create time series visualizations of results of a three-dimensional simulation of the Earth's environment.

Please review the [default selections](#) below and make your changes.

To start the graphics program click the *Update Plot* button. The resulting image will be displayed at this location of the page.

Should the result be a black image, then the graphics program encountered a programming error. Please report the set of input parameters used.

*Update Plot* will update (generate) the plot with the chosen time and plot parameters below.

This will take some time (typically 10-30s) as data is read in and processed.

**Plot Options:**

Exclude region around the Earth up to  R<sub>E</sub>

Use satellite track

Use satellite name at SSCWeb:

**Note:** Satellites may not always be available. Model data may be unavailable.

Image magnification

(all images; use >=1.25 for 3D)

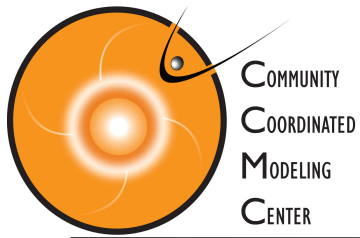
Choose **Plot Mode:**

Choose **quantity** to be displayed (some require up to three choices):

Q 1:   Q 2:   Q 3:

- Geotail
- GOES-10
- GOES-11
- GOES-8
- GOES-9
- IMAGE
- IMP-8
- Interball-Tail
- LANL-89
- LANL-90
- LANL-91
- LANL-94
- LANL-97
- Moon
- Polar

“Use Satellite Track”  
option with list of  
applicable satellites



# DEMO: visualization of time series

1) Metrics study tool:  
GEM 2008 study,  
B at GOES satellites

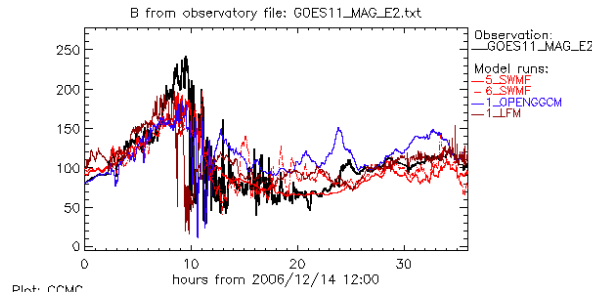
[http://ccmc.gsfc.nasa.gov/cgi-bin/run\\_metrics\\_vis.cgi?study=GEM2008&event=2&metrics=1&obs=GOES11](http://ccmc.gsfc.nasa.gov/cgi-bin/run_metrics_vis.cgi?study=GEM2008&event=2&metrics=1&obs=GOES11)

Select quantity

Select color

Select line style

Have scores calculated

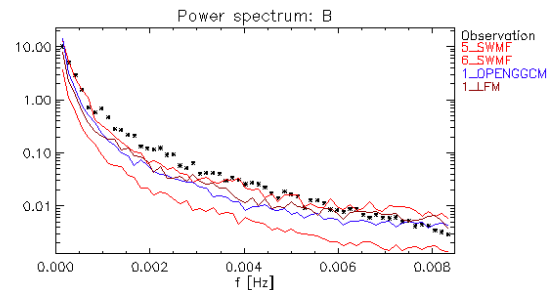


Plot: CCMC

**Figure: B from observatory GOES11 and model runs**  
**Campaign: GEM2008**  
**Metric study: Magnetic field at geosynchronous orbit**  
**Event: December 14, 2006 12 00 UT - December 16, 00 00 UT**

Model_Setting	PredEff	N_region	N_finite	LogSpecDist	nWin	PredYield	Correlation
5_SWMF	0.703	2161	2161	0.901	69	0.659	0.858
6_SWMF	0.568	2161	2161	0.471	69	0.790	0.761
1_OPENGGCM	0.264	2161	2140	0.572	68	0.866	0.590
1_LFM	0.158	2161	2158	0.332	68	0.910	0.466

PredEff Prediction Efficiency metric  
 N\_region the number of samples in the selected time window  
 N\_finite the number of points that were used for comparison (ie., those that were not NaN or infinite)  
 LogSpecDist Log-Spectral Distance metric  
 nWin the number of windows used for the spectral analysis (120-minute windows, offset by 30 minutes from the neighboring windows)  
 PredYield is the ratio of the range of modeled values (max minus min) compared to the observation (max minus min)



**Publication Policy:** Please contact the model owners before you use results for any presentation or publication ([full Publication Policy](#)).

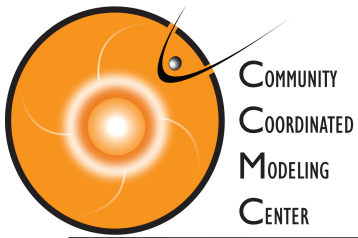
To track usage for our government sponsors, we ask that you notify [CCMC staff](#) whenever you use CCMC results in a scientific publication or presentation. Thank you.

[Go back to metrics challenge table](#)

Update Plot will update (generate) the plot with the chosen time and plot parameters below.  
**This will take some time (typically 10-30s) as data is read in and processed.**

Start: Year:  Month:  Day:  Hour:  Minute:  Second:

to End: Year:  Month:  Day:  Hour:  Minute:  Second:



# Progress: interactive timelines

## GEM-CEDAR Challenge: Climatology

The screenshot shows the CCMC website interface. At the top left is the CCMC logo. Below it is a navigation menu with links for "About", "Models at CCMC", "Request A Run", and "View Re". A breadcrumb trail below the menu reads "Home | GEM Challenge | CEDAR ETI Challenge | GEM-C". The main content area is titled "GEM-CEDAR Challenge: Climatology" and contains several sections:

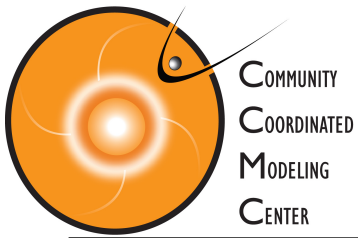
- Prior to submission of your simulation results please review:**
  - Selected events
  - Physical parameters
  - Ionosphere's available measurements/stations/locations
  - Magnetosphere's available measurements/stations/locations
  - Model output file format
  - Submission Instruction**
- Register a new model setting
- Submit your simulation results
- Simulation Results Analysis Tools**
  - Time series plotting tool (ionosphere/thermosphere)
  - Time series plotting tool (magnetosphere)
  - Runs for metric studies performed at the CCMC (ionosphere)
  - Runs for metric studies performed at the CCMC (magnetosphere)
- Climatology Project**
  - The year of ISR observations (March 2007 - March 2008)
- Feedback Collection**

On the left side of the page, there is a sidebar with a box containing the following text:

**March 2007 - March 2008**  
Electron Density  
[CTIPe](#), [TIEGCM](#), [CHAMP](#)  
Neutral Density  
[CTIPe](#), [TIEGCM](#), [CHAMP](#)

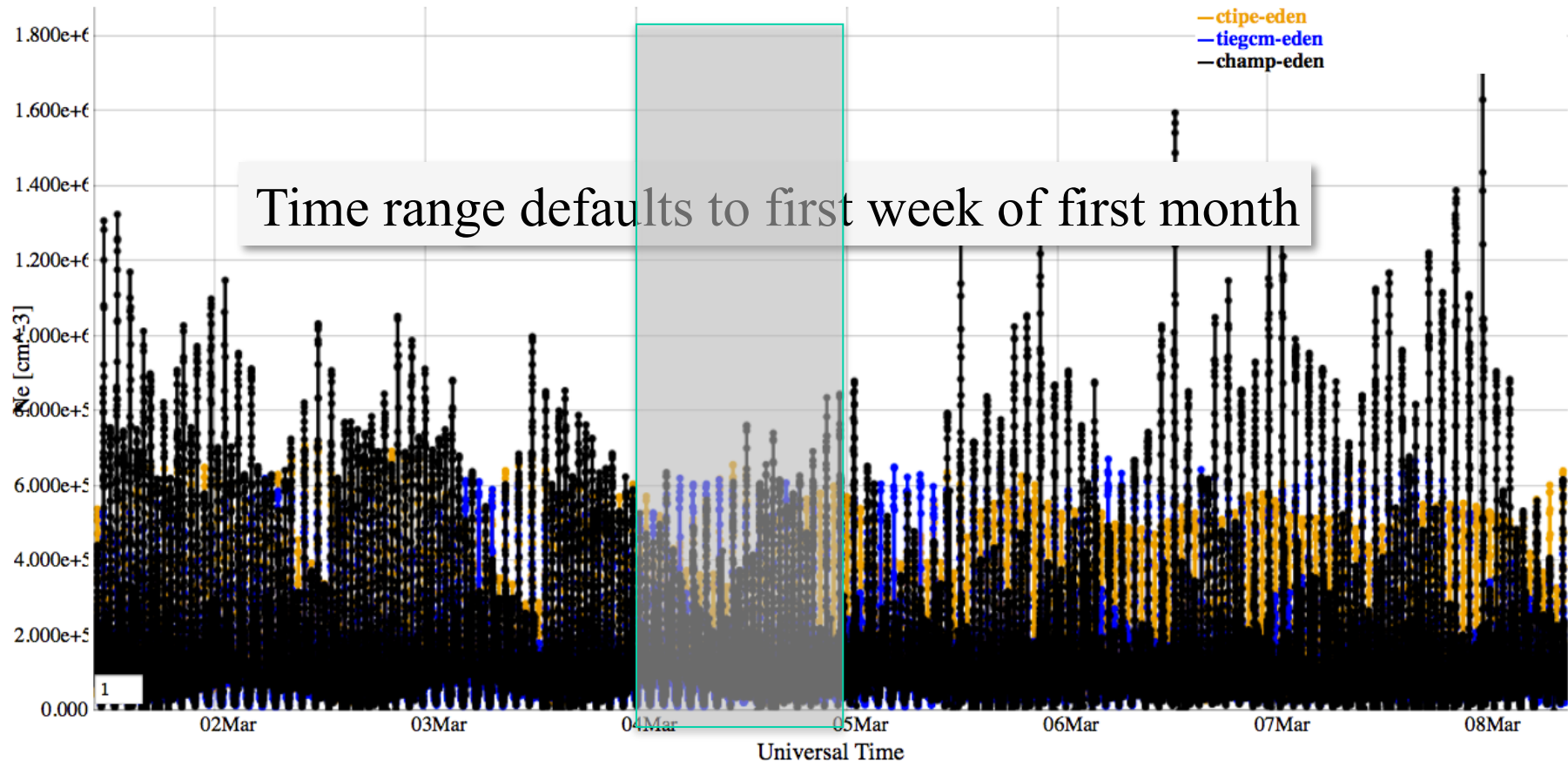
At the bottom left, the text "CCMC Student Research Contest" is partially visible. On the right side, there is a NASA logo and a "Sitemap" link.





# Progress: interactive timelines

Click the check boxes to toggle series visibility

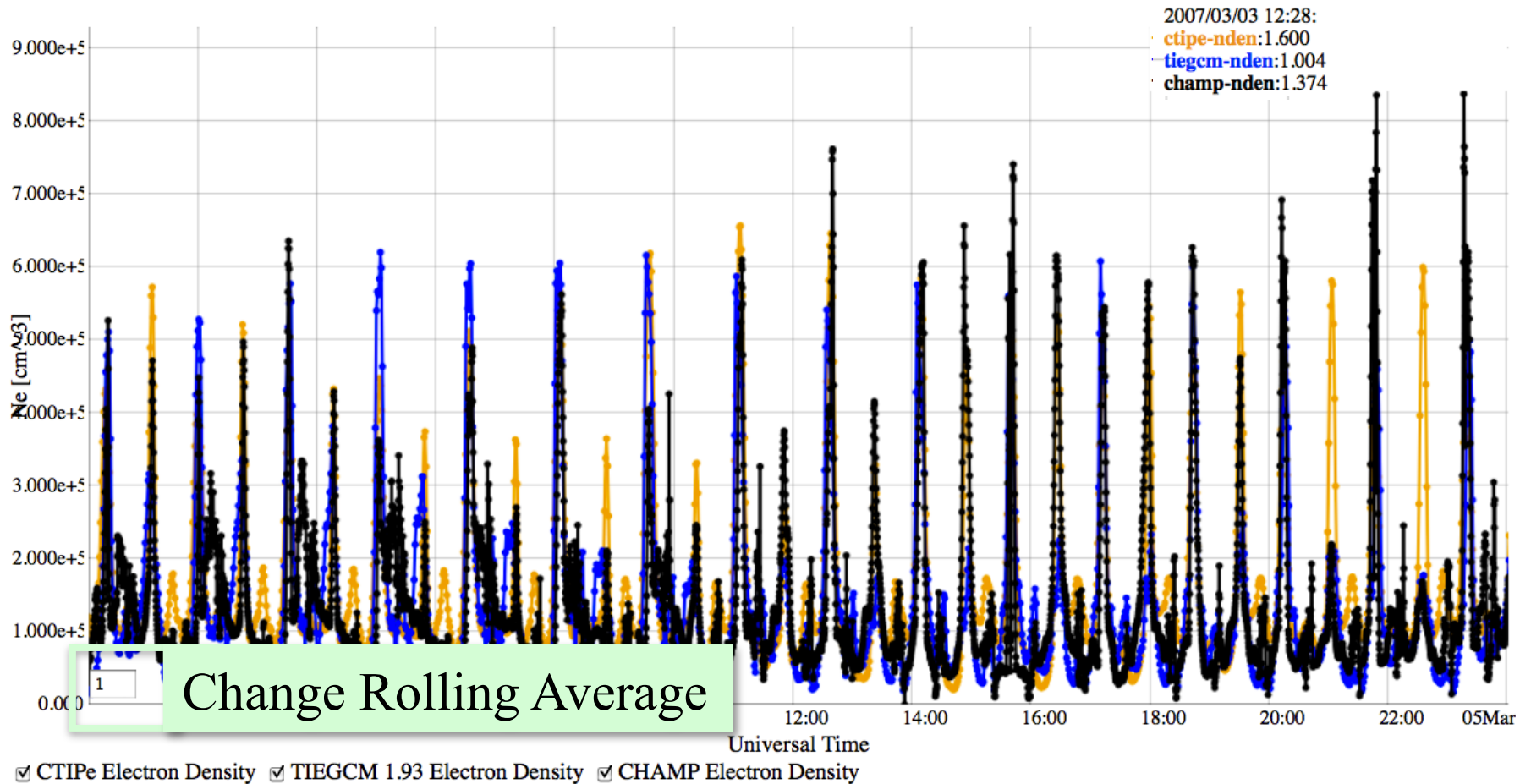
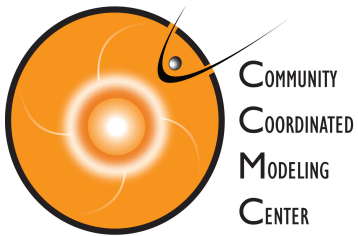


CTIPe Electron Density  TIEGCM 1.93 Electron Density  CHAMP Electron Density

Zoom: [hour](#) [day](#) [week](#) [reset](#) Pan: [left](#) [right](#)

2007 [March](#) [April](#) [May](#) [June](#) [July](#) [August](#) [September](#) [October](#) [November](#) [December](#) 2008 [January](#) [February](#) [March](#)





Zoom: [hour](#) [day](#) [week](#) [reset](#) Pan: [left](#) [right](#)

2007 [March](#) [April](#) [May](#) [June](#) [July](#) [August](#) [September](#) [October](#) [November](#) [December](#) 2008 [January](#) [February](#) [March](#)